Modifications for the Alinco DJ-160

The new Alinco DJ-160 Radio will receive between 137-174 Mhz, and transmit in the 2Meter band only (144-148Mhz). A simple modification to the radio will enable it to transmit in the full range it receives currently. I have not tested the output power on other frequencies (Due to my one and only watt meter getting fried) however I have tried setting a weather receiver a small distance away, and I did hear the radio in the receiver. To make the mod,
the following must be done: (I assume that you have some experience with electronics and that you can tell a wire from a resistor, from a transistor)

1) Take the battery of the radio by lifting the battery release button. If you look at the bottom of the radio, there will be a metal plate that is held on with 4 small screws. Take this plate off, noting exactly how the clip was held on (like the slot for the battery release clip)

2) On the back of the radio there are two screws that hold the back of the radio on, take these screws out.

3) Now you should be able to lift the bottom part of the radio by the battery release button slightly apart. I was told that you should take the top knobs off, but I found that I didn't have to.

4) If you take the Battery Release Button and turn it about 90 degrees, the button should come out easily. After you get the small piece of plastic that is the button, you should see a yellow wire behind where the clip was.

5) Take a small wire cutter and CUT this YELLOW wire. You should probably make sure that the wire doesn't have bare metal showing from a lousy cutter, because I don't think that grounding this wire
to the case would be HEALTHY for your radio. :-)

6) After You cut this wire. Assemble the radio, and just before you turn on the radio, do a power reset by holding the FUNC button while turning on the radio. This will reset the radio to ALL of the factory set parameters. YOU WILL LOOSE PROGRAMMED FREQUENCIES that were programmed into the memory mode of the radio, so just write the frequencies down before proceeding with the above instructions.

7) The radio should be just like new, except that the transmit will be enabled for ALL frequencies! GOOD Luck!

If you use these mods for ILLEGAL purposes, pity upon thy sole, for you do not belong in the ranks of Amateur Radio. This information is only supplied for Legal and Informational Purposes only and I can NOT be held responsible for anything that you do with this INFO. And if you screw up your radio, TOO BAD. I can't be
held responsible.

Note: I haven't tried or verified this, proceed at your own risk.
Do not do this mod unless you have a legal and good reason, like being in MARS, or to drive a transverter.
Do not transmit outside of legal bands. I don't have any info beyond what is above, sorry.

DJ-160.TNC

Being new to packet, I had a hard time figuring out how to connect my. Alinco DJ160 HT to my TNC. Like many HT's Alinco

has no documentation on packet hook ups.
After experimenting I finally was able to get the connection to work. Buck Rogers book PRIME has HT connections but none for my radio. I found that if I used the connection for the ICOM 2AT it worked fine.

At the tip connection of the 2.5mm mini plug, connect a 4.7K Ohm resistor and a .1 mfd Capacitor. Connect the lead from the resistor to the TNC PTT line and the lead from the capacitor to the TNC transmit audio line.
I connected the groubd line from the plug to TNC ground. Receive audio is simply connected through the ext speaker jack to TNC receive audio. I run a KPC-1 TNC.

Extended xmit for DJ-160-T

The new Alinco DJ-160 Radio will receive between 137-174 Mhz, and transmit in the 2Meter band only (144-148Mhz). A simple modification to the radio will enable it to transmit in the full range it receives currently. I have not tested the output power on other frequencies (Due to my one and only watt meter getting fried) however I have tried setting a weather receiver a small distance away, and I did hear the radio in the receiver. To make the mod, the following must be done: (I assume that you have some experience with electronics and that you can tell a wire from a resistor, from a transistor)

Take the battery of the radio by lifting the battery release button. If you look at the bottom of the radio, there will be a metal plate that is held on with 4 small screws. Take this plate off, noting exactly how the clip was held on (like the slot for the battery release clip)
On the back of the radio there are two screws that hold the back of the radio on, take these screws out.
Now you should be able to lift the bottom part of the radio by the battery release button slightly apart. I was told that you should take the top knobs off, but I found that I didn't have to.
If you take the Battery Release Button and turn it about 90 degrees, the button should come out easily. After you get the small piece of plastic that is the button, you should see a yellow wire behind where the clip was.
Take a small wire cutter and CUT this YELLOW wire. You should probably make sure that the wire doesn't have bare metal showing from a lousy cutter, because I don't think that grounding this wire to the case would be HEALTHY for your radio. :-)
After You cut this wire. Assemble the radio, and just before you turn on the radio, do a power reset by holding the FUNC button while turning on the radio. This will reset the radio to ALL of the factory set parameters. YOU WILL LOOSE PROGRAMMED FREQUENCIES that were programmed into the memory mode of the radio, so just write the frequencies down before proceeding with the above instructions.
The radio should be just like new, except that the transmit will be enabled for ALL frequencies! GOOD Luck!

If you use these mods for ILLEGAL purposes, pity upon thy sole, for you do not belong in the ranks of Amateur Radio. This information is only supplied for Legal and Informational Purposes only and I can NOT be held responsible for anything that you do with this INFO. And if you screw up your radio, TOO BAD. I cant be held responsible.

Alinco DJ160T Supplementary Notes

(c) Marty Goodman February 1992

The manual for the Alinco DJ160T is remarkably badly written, and certain functions in particular (DTMF squelch and paging, DTMF decode) are especially hard to understand. Ive puzzled out most of this, and have written up for my own reference the following notes. Some of what follows will be relevant to other Hand talkies than the DJ 160T, especially other Alinco hand talkies such as the DJ 460T and DJ 560T.

Introduction:
Keys on the Alinco are given here in brackets []. The function key is given as [f].

DTMF functions:

There are three broad categories of DTMF functions supported by the DJ160T. These are DTMF squelch, DTMF paging, and DTMF decoding. DTMF paging is further broken down into DTMF group paging and DTMF personal paging.
DSQ overview

To use the DTMF squelch and page functions, you must first SET your DTMF code(s). This is done using the [f] [DSQ set] button combination. Now you can enter FIVE digits that determine DSQ functions. They are displayed as a group of three digits, a period, a single digit, another period, and a final fifth digit.
The FIRST THREE DIGITS are used for DSQ squelch and for DSQ group paging. This is the three digit code required to break a DSQ squelch, or the three digit "group page code" that, when followed by a *, will cause the handitalki to beep when the hand talkie is placed in G DSQ or GP DSQ modes.

These three digits are really the most important ones! The other two digits are part of personal paging / personal ID options that are complex of less importance in day to day use. However, I do explain their functions.

The fourth digit is the single digit used in combination with the group

code to page a particular person in a group. Note that some newer hand talkies provide for a three digit personal code. This may be why the Alinco uses two *s as part of its group page format, where the *s are dummies for the missing two digits that other radio DTMF systems use in their personal codes. The Alinco DJ160T has provisions to transmit and receive any three digit personal code ("Additional Feature of DSQ Function" on page 27 of the manual), but implementing that provision is hideously complex and probably not worth bothering with.
The fifth digit is REWRITTEN whenever the radio receives a proper group or personal page code, and will display personal code number that was received. It is transmitted only when the radio is in GP DSQ mode. It is NOT transmitted when the radio is in DSQ or G DSQ modes. See below.

To set the DSQ number, push [f] [DSQ set], enter five numbers, then push [V/M].

NOTE:
In the examples that follow, I will assume you have programmed the code 123.4.5 into your DSQ using the DSQ set function.

(a) DSQ Squelch Operation:

Receive Mode:
DSQ squelch is used to cause the radio to be silent (squelched) while in receive until it receives a three digit code. IF it receives the correct three digits during the first second or two of a transmission, it will release the squelch and the receive the rest of that transmission.

Transmit Mode:
When used to transmit, the radio will automatically transmit the three digit DSQ group code right after you press the [PTT] button, so remember to pause a moment before talking if using the radio in DSQ mode.

To set DSQ Squelch, push [f] [GP DSQ] until DSQ is displayed. Be sure that ONLY DSQ is displayed, not G DSQ or GP DSQ. Normally, if you start with no DSQ display, hitting [f] [GP DSQ] once will cause DSQ only to be displayed.

Summary of DTMF Squelch function:

Receive: Radio remains squelched unless it receives the tones 1,2,3

Transmit: Radio transmits the tones 1,2,3 whenever [PTT] is pressed.

(you must hold down the PTT button throughout your transmission. If you let go of the PTT button, you must re-transmit the three digit code if you want the receiver to hear you! This is not a problem when using one DJ160 with another, but can be if you are using the DJ160 with a different radio where manual entry of the DTMF tones is required)

NOTE:
If using another radio to manually send DTMF squelch codes, the three digits must be punched in within a space of 1.5 seconds total.

(b) DTMF page function:

This mode is set using the [f] [GP DSQ] buttons. Hold down the [f] button and press the [GP DSQ] button until G DSQ or GP DSQ is displayed. G DSQ stands for group page mode, and GP DSQ stands for personal page mode. Normally if no DSQ function is displayed, you hold down the [f] key and press the [GP DSQ] key once to display DSQ, twice to display G DSQ, three times to display GP DSQ, and a fourth time to clear the DSQ function from the display.
Receive Mode: In this mode, the radio is silent until it receives the proper page tone sequence. At that point, it will beep in a fashion that is characteristic of either receipt of a group page or of a personal page. The tone for a group page consists of several dual beeps, with all beeps being of the SAME tone. eg: beep beep beep beep beep beep etc.
The tone for a personal page consists of several dual beeps, but the two beeps within each dual beep are of different frequencies. eg: beep boop beep boop beep boop etc.

NOTE:
The radio behaves EXACTLY the SAME when in either G DSQ or GP DSQ modes when it is RECEIVING. The two modes (G DSQ and GP DSQ) differ ONLY in terms of what tones get transmitted when you push the [PTT] button!! I recommend you use only the G DSQ mode, for it is simpler to understand. But I will attempt to shed some light on the GP DSQ mode too.

Group Paging:

Receive:
(Radio may be set to either G DSQ or GP DSQ) Radio must receive group code (1,2,3) followed by a star (*) at a minimum in order to produce the pager tone. If the radio receives ONLY the three digit group code followed by a star (1,2,3,*) it will give the group page beep, the "G" in the G DSQ of the display will flash, but "Err" will be shown in the main display because the personal code was not properly sent. If the radio receives a group code followed by a star followed by a personal code OR a group code followed by a star followed by a personal code followed by two stars (1,2,3,*,4) or (1,2,3, *,4,*,*) it will give the beep for receipt of a group page, the "G" on the display in the G DSQ will flash, AND, if you press [f] [DSQ set] the fifth digit displayed will be the personal code that was just received (4 in this case). If the unit was set for 123.4.5 in the DSQ SET mode, that display will be altered to 123.4.4 to reflect the fact it received a "4" as a personal code digit. After a page is received and the "G" in the display is flashing, pushing [V/M] button once will cause the G to stop flashing.

Transmit:
The DJ 160T must be in G DSQ mode to properly transmit a group page (not in GP DSQ mode). Pressing the [PTT] key will automatically send out the group code, followed by a star, followed by your personal code (fourth digit in the DSQ set display), followed by two stars (1,2,3,*,4,*,*).

Personal Paging:
This is a somewhat complicated variant of group paging, used to page a particular person in a group. Not only is it complicated, but the implementation on the Alinco DJ 160T differs from that used on some other radios, for the Alinco uses a single digit personal code where other radios sometimes use a three digit personal code. Generally I recommend users not bother with this overly complicated feature, but I will attempt to at least partially document it here. Its primary use where you have a party of several individuals all with the same group but different personal paging codes. In this situation one can either page all members of the group using the group page function OR page a given individual member of the group using the personal page function.

Receive:
The radio may be set to display either "G DSQ" or "GP DSQ". This is done using the [f] [GP DSQ] buttons. If the three digit group code followed by a single digit personal code followed by a star is received (1,2,3,4,*), the unit will make the "personal page type" tone (beep boop), the "GP" in the display will flash, and "Err" will be displayed on the main display. The "Err" is displayed because a personal identifier digit was not sent. If in addition to the above codes a personal identifier

code is received (1,2,3,4,*,7) the radio will make the personal page type beeping and "GP" will flash. In addition, the last digit of the DSQ code will be re-written to 7, to reflect the fact that a page FROM the person with code number 7 was sent. Pushing [V/M] button will stop the flashing of the "GP" in the display.

Transmit:
(Pay CLOSE attention here! The radio uses the numbers in its DSQ SET significantly differently when transmitting in GP DSQ mode than it does when in G DSQ mode!) Radio MUST be in GP DSQ mode (NOT G DSQ mode) to properly automatically transmit a personal DTMF page. Let us assume that you have set your DSQ code to 123.4.5. When the [PTT] button is pressed, the radio will send the following tones: 1,2,3,5,*,4.
The first three tones sent are the group code. This is followed by personal code of the person you want to PAGE. Then a star is sent, then YOUR personal code is sent as an identifier. Note carefully that it is the FIFTH (last) digit of the five digit DSQ number that is sent as the FOURTH digit of the DTMF transmission when you are in GP DSQ mode! Note too that this last digit is rewritten every time you RECEIVE a page, so if you want to send a personal page to someone OTHER THAN the person who paged you last, you must use DSQ SET to rewrite the last digit of your five digit code to specify the personal code digit of the person you want to page. Alternatively, note that when you enter GP DSQ mode by pressing [f] [GP DSQ] three times, the five digit code is displayed. At this point, entering a SINGLE digit will usually cause the fifth digit to be changed to whatever you want it to be. Pressing [f] [GP DSQ] a fourth time will put the radio in GP DSQ mode, removing the display of the five DSQ code digits.
If no code is entered when the GP DSQ display of the code is called up, after about 5 seconds the display will automatically revert to the normal radio display with GP DSQ set. Alternatively, you can reset the entire DSQ display using the [f] [DSQ set] button combination. In any case, when using the GP DSQ (personal page) function, you must each time check the code to make sure you have set the personal and group code correctly. Be especially careful that the outgoing personal code (last digit of the display) is correct for the person you want to page.

Summary of DSQ Code digits:

```
123.4.5    in display
 a  b c
```

a Three Digit Group Code.

DTMF Squelch:
(receive mode) These three digits must be received to break squelch when DTMF squelch (DSQ only displayed) is used.
(transmit mode) These three digits only are transmitted when in DSQ mode upon pressing the [PTT] button. example: if you have set 123.4.5 as your DSQ code, when you press [PTT] in DSQ mode 1,2,3 will be transmitted.

Group and Personal Page functions: These three digits are used as the group code in both group and personal paging functions and are the first three digits transmitted as part of a larger group or personal page code transmission. They are the first three digits that MUST be received when trying to activate a group or personal page. See below for more details.

b This is YOUR personal page code.
DTMF Squelch:
This digit IS NOT USED in DTMF squelch functions.

Group Paging:
(receive mode) this digit IS NOT USED in group paging receive mode. ONLY the first three digits and the last digit are used when receiving a group page.

(transmit mode) When you press [PTT] in G DSQ mode, first the three digit group code is sent, then a star, then this digit (your personal page code) is sent followed by two stars (1,2,3,*,4,**). Thus, this digit is the digit that is SENT OUT TO OTHERS to identify to them who has sent the page. It will be displayed in the fifth digit of the DSQ code display on all radios that received your group page, to identify you as the one who sent the page.

Personal Paging:
(receive mode) this digit specifies what "other party code" must be sent by someone trying to page you personally. In order to receive a PERSONAL page, your radio must receive the group code followed by this digit followed by a star (1,2,3,4,*). Preferably you should receive all that PLUS an additional single digit that identifies who was sending you the page (1,2,3,4,*,N where N is a single digit that identifies the person who sent the page). If this last identifier digit is not sent, you will

hear a personal page type beep, and "GP" will flash, but "Err" will be on the main display indicating that a personal identifier code was not received.

(transmit mode) This is the digit sent out LAST when you press the [PTT] button. It identifies YOU as the person sending the page. example: with DSQ set to 123.4.5 if you press [PTT] 1,2,3,5,*,4 will be sent. The 4 is received and displayed as the last digit of the DSQ code on all radios that received your page.

c This is the single digit code for "the other party".
DTMF Squelch:
This digit is NOT USED in DTMF squelch functions.

Group paging:
(receive mode) This digit is re-written any time a proper group page is received to reflect the number of the other party who sent you the page. example: you have 123.4.5 in your DSQ setting and you now receive a group page consisting of 123*8** (or one simply consisting of 123*8). Your pager will make the group page type beep, "G" will flash in the display, AND, if you go to DSQ set mode, you will see that the last digit of the code displayed is now NOT a 5, but is instead an 8, informing you that "person number 8" was the originator of that group page. Thus, if your page code WAS set to 123.4.5 and you receive the group page 123*8**, when you now press [f] [DSQ set] you will no longer see 123.4.5 but instead see 123.4.8.

(transmit mode) This digit is NOT USED in group page transmit mode.

Personal paging:
(receive mode) This digit is re-written any time you receive a valid personal page, and will display the personal code of the person who sent that page. example: you have 123.4.5 as your DSQ code, and you receive the following sequence: 1234*7 Your pager will now make the personal page type beep, "GP" will flash on the display, and if you press [f] [DSQ set] you will no longer see 123.4.5 displayed, but instead will see 123.4.7. The last digit reflects the fact you received a personal page from a person whose own personal code is 7.

(transmit mode) This is the digit that is sent out FOURTH when you push the [PTT] button. It specifies which person in the group will receive the personal page. You must be careful to set this digit correctly for the person you in the group who you wish to page, keeping in mind that this digit gets re-written every time you receive a page of any kind! If you have 123.4.5 set as your DSQ code, pressing [PTT] in GP DSQ mode will cause 1,2,3,5,*,4 to be transmitted. Note very carefully that this, the fifth digit in your DSQ setting display, is sent out FOURTH when you are in GP DSQ mode and press the [PTT] button!

DTMF Wild Card function:

If you forget a squelch or paging code, you can pick up and decode codes sent by others. Use [f] [DSQ set] to set DSQ first to 000.0.0 and then set it to ###.0.0. (upside down As will be displayed instead of #s).
Now set your radio to G DSQ mode. If you receive ANY valid page, the radio will beep. Press [f] [DSQ set] and the ###.0.0 display will be replaced by the page code you just received.

DTMF Decode function:

At any time, any codes received will be decoded and kept in the M3 dialing number. Thus, any time you hear a bunch of DTMF codes on the air, you can press the [Dial Ch] button, then rotate the top selector know so that M3 is displayed, then use the up and down arrow buttons (* and #) to scroll the display right (up arrow) or left (down arrow). Up to 16 digits will be retained. You can also set the radio to DSQ mode while lying in wait to receive DTMF tones. That way, the radio will break squelch when it has received three or more DTMF tones, alerting you to the fact it has captured a code. Note: according to the manual, you must have phone numbers stored in one or both dial memories (M1 and M2) for the decode to work. But in my experience that does not seem to be required by my unit.

DJ160 DTMF Decode

I received your message about the DTMF decoding on the DJ-160, and I thought I should tell you that the process is not that complicated.

Put radio on frequency to catch tones to be decoded.

Push the DIAL CH button (lower right corner of keypad) The LCD will indicate the channel currently selected. The channel must be 3 to decode DTMF. If it is not Channel 3 then use the M button (top left) to change selected channel. Once you have the M3 in the window you can push the DIAL CH button again to bring the display back to indicate the frequency. The word DIAL will remain in the lower right corner of the LCD window.

From this point on any DTMF will be stored in MEM channel 3, but you can not receive DTMF while you are looking at MEM channel 3 , you must be looking at the frequency being displayed while decoding. To see the decoded data, just push DIAL CH and read the displayed data. Use the frequency knob to rotate the stored DTMF tones that do not appear. The radio will store 16 digits on each transmission, but the window will only show about 6 at a time. As your message indicated, any new data will over write the old...
73 Joe KC4WTX @ KB4VOL

DJ-160SX (Japanese) Extended RX and TX.

Author: *7L3AXT/7 & JM7OCK*

How to expand RX range of DJ-160SX.
This is a "keypad" mod.

Push "B" key with "F" key. Then display will be "KL" or "FL".

Push "2" key, next push "1" key, next push "2" key, with "F" key.
Then display will show "OPEN" and beep, then finish.

Push "B" key with "F" key, which will make "KL" or "FL" disappear from the display.

Band select key is "B".

Expanded RX range will be 108-174MHz & 850-910MHz.

How to expand TX range of DJ-160SX.

Cut off BP1 and BP2 jumpers. BP1 is behind the battery release clip, with a yellow wire; BP2 is located right above it, hidden. The jumper is a blue wire.

Hit "All reset". Then TX frequency will be 130.00MHz - 173.995MHz.

This is the second step. If you modify all steps, frequency range will be:

RX 108-142.995MHz
TX&RX 130-173.995MHz
RX 850-909.995MHz

Again, select the band with the "B" key to the right of the radio.
Hope this helps!

Loren Fields
N1UMF

Adjustment points for DJ-160T / DJ-460T

1. Transmitting Unit

Item	Adjustment Point	Adjustment Method	Spec
1. Frequency adjustment	TC304 (RF PCB)	Set the unit in the transmission mode at 146.03 MHz and adjust TC304. (Transceiver tester, counter)	144.03 MHz ±50 Hz
2. TX Power adjustment	VR301 (RF PCB) (Hi power) VR302 (RF PCB) (Lo Power)	Adjust VR301 so that TX power becomes 3 W at 146.03 MHz. Adjust VR302 so that TX power becomes 300 mW at 146.03 MHz.	3.0W ±0.1W 300mW ±50mW
3. Modulation degree adjustment	VR204 (IF PCB)	Input a signal of 1 KHz/50mV into the MIC jack, transmitting at 146.03 MHz and adjust VR204 so that you obtain 4.7 KHz/DEV in the transmission mode.	4.8 KHz ±0.1 KHz
4. Sub audible tone	VR203 (IF unit)	Adjust 88.5 KHz by VR203 so that you obtain 800KHz/Dev	800 Hz ±100 Hz
5. DTMF	VR205 (IF PCB)	Push **[1]** in the transmission mode and adjust VR205 so that you obtain 3.1 KHz/Dev.	3.1 KHz ±100 Hz

2. Receiving Unit

Item	Adjustment Point	Adjustment Method	Spec

1. VCO P/D voltage adjustment	L106 (VCO)	Adjust L106 so that P/D voltage is 2.0 V at 146.03 MHz. (DC voltmeter) in the transmission mode.	2.0 V
2. Detection Coil adjustment	L202 (IF PCB)	Input 1KHz, 3.5 KHz/Dev. +66dBµ at 146.05 MHz and adjust L202 so that detection power becomes maximum	
3. VHF FRONT END adjustment	L306, L308, L309, TC305, L311, L312 (RF PCB)	At 146.03 MHz and adjust L306, L308, L309, TC305, L311 and L312, so that 12 dB SINAD sensitivity becomes maximum.	Under -9 dBµ
4. S-meter adjustment	VR202 (IF PCB)	Input a signal of 17 dBµ from transceiver tester at 145.03 MHz. Turn VR202 so that **[FULL]**-bar begins to light.	17dBµ ±1 dBµ

Adjustment points for DJ-160E / DJ-460E

1. Transmitting Unit

Item	Adjustment Point	Adjustment Method	Spec
1. Frequency adjustment	TC304 (RF PCB)	Set the unit in the transmission mode at 145.03 MHz and adjust TC304. (Transceiver tester, counter)	145.03 MHz ±50 Hz
2. TX Power adjustment	VR301 (RF PCB) (Hi power) VR302 (RF PCB) (Lo Power)	Adjust VR301 so that TX power becomes 3 W at 146.03 MHz. Adjust VR302 so that TX power becomes 300 mW at 146.03 MHz.	3.1W ±0.1W 300mW ±50mW
3. Modulation degree adjustment	VR204 (IF PCB)	Input a signal of 1 KHz/50mV into the MIC jack, transmitting at 145.03 MHz and adjust VR204 so that you obtain 4.7 KHz/DEV in the transmission mode.	4.7 KHz ±0.1 KHz
4. Subaudible tone	VR203 (IF unit)	Transmit at 145.03 MHz and adjust VR203 to obtain a frequency modulation of 3.0 KHz, making sure that tone burst 1750 Hz within a range of 1750Hz ±20 Hz	3.0 KHz ±500 Hz
5. DTMF	VR205 (IF PCB)	Puch **[1]** in the transmission mode and adjust VR205 so that you obtain 3.1 KHz/Dev.	3.1 KHz ±100 Hz

2. Receiving Unit

Item	Adjustment Point	Adjustment Method	Spec
1. VCO P/D voltage adjustment	L106 (VCO)	Adjust L106 so that P/D voltage is 2.0 V at 145.03 MHz. (DC voltmeter) in the transmission mode.	2.0 V ±0.1 V
2. Detection Coil adjustment	L202 (IF PCB)	Input 1KHz, 3.5 KHz/Dev. +66dBµ at 145.05 MHz and adjust L202 so that detection power becomes maximum	
3. VHF FRONT END adjustment	L306, L308, L309, TC305, L311, L312 (RF PCB)	At 145.03 MHz and adjust L306, L308, L309, TC305, L311 and L312, so that 12 dB SINAD sesitivity becomes maximum.	Under -9 dBµ
4. S-meter adjustment	VR202 (IF PCB)	Input a signal of 17 dBµ from transceiver tester at 145.95 MHz. Turn VR202 so that **[FULL]**-bar begins to light.	17dBµ ±1 dBµ